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WARNING

It is against the law to manufacture, purchase, or possess a firearm silencer without proper authorization from and registration with the Bureau of Alcohol, Tobacco, and Firearms (BATF) of the U.S. Treasury Department. Inquiries regarding the procedures for applying for a license to construct, purchase, or possess a silencer and for paying the appropriate tax must be directed to that office.

In addition, many state and local jurisdictions have restrictions on the possession of silencers, even if appropriately taxed and registered with federal authorities. Also be advised that some authorities maintain that adapters and couplings in and of themselves count as suppressors if they are used to hold improvised silencer components.

Do not attempt to construct a silencer without proper authorization from federal, state, and local authorities. This book is presented for academic study only.

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The technical data presented here, particularly concerning the use, adjustment, and alteration of firearms, inevitably reflects the author's beliefs and research with particular firearms, equipment, components, and techniques under specific circumstances which the reader cannot duplicate exactly. The information in this book should therefore be used for guidance only. Neither the author, publisher, or distributors of this book assume and responsibility for the use or misuse of the information contained herein.

Introduction

This book is a continuation of an earlier tome, *Workbench Silencers: The Art of Improvised Designs*. No sooner had the former gone to press when the creative juices—which I thought had pretty well dried up—began flowing again with even more improvised silencer designs. For those not familiar with the earlier work, a few words of explanation are in order.

I'm a part-time inventor who became interested in silencer design. My background research included material on improvised silencers as well as patented designs and expensively machined models. In spite of my credentials as a legitimate inventor and my impeccable police record, the local chief of police would not sign my federal "Application to Make and Register a Firearm" form. Without his signature, I wouldn't be able to get BATF (Bureau of Alcohol, Tobacco, and Firearms) permission to build and test a prototype of my silencer design which, if successful, I had hoped to patent.

Since I couldn't manufacture my prototype, I decided to write a book instead—a book on improvised silencer designs that I had dreamed up myself after having been inspired by the work of others that I had come across in my research. Of course, I couldn't legally fabricate any of these designs, so I simply showed how the components could be assembled and illustrated the "finished" silencers with plaster of Paris dummies mounted on the barrels of the guns. The same procedure has been followed here. I also invited licensed

silencer manufacturers to test my designs and send the results of their research to me in care of the publisher. Ditto for this volume.

What's new this time around? The most important development is three designs embodying the "perforated tube" principle, in which the expanding gases following the bullet down the bore of the silencer are vented off through perforations in the tube that makes up the core of the silencer. In my earlier work, I had described perforated tube silencers but had also advised that none of my designs incorporated the principle because it required near perfect alignment that is very difficult to achieve. That problem has since been overcome by a technique that involves sliding a snug-fitting tube over a cylindrical gun barrel minus sights. Two of these designs involve nesting tubes within tubes to form a silencer bore that is smaller than the outside diameter of the gun barrel but slightly larger than the inside diameter of the gun barrel.

There are four designs for slip-on silencers that can be friction-fitted directly onto the Ruger .22 bull barrel pistol, a new design for a Makarov 9x18/.380 pistol, and a couple of new angles on muffler and plastic bottle silencers. The final design is for a silenced shotgun that fires subsonic slugs.

Tools and Materials

Most of the tools required for these designs are the same as those listed in the first book. They include hacksaw, modeling knife, screwdriver, punch, scissors, electric drill, and Dremel Moto-Tool (for cutting slots in PVC). Additional tools include a drill guide (indispensable for the perforated tube designs), round and flat files (for shaping PVC fittings and neoprene washers to size), and a paper punch (for making holes in cardboard washers). Adhesives—tapes and glues—are the most commonly used materials. Tape on hand should include metal repair tape, black electrician's tape, and masking tape; glues should include epoxy, all-purpose glue, and white shop glue. Other material components will be listed separately at the beginning of each silencer description.

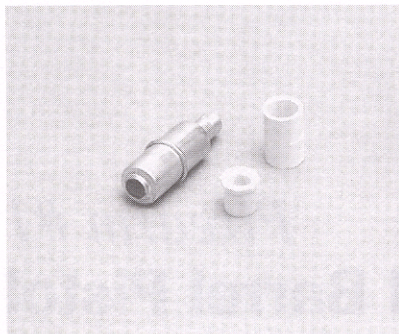
Firearm #1

Ruger Bull Barrel Pistol



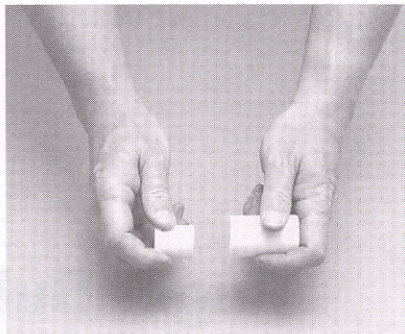
The front sight on the Ruger bull barrel pistol can be removed by taking out a single screw, leaving a perfectly cylindrical barrel onto which to fit a silencer or adapter.

MUFFLER SILENCER AND ADAPTER

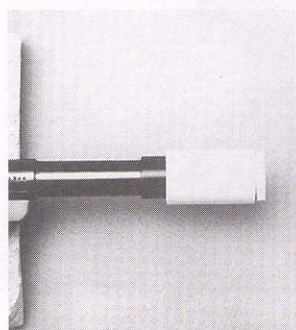


Materials needed:

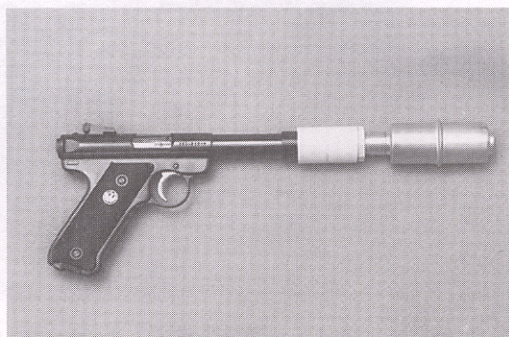
- 3/4" coupling
- 3/4" x 1/2" PVC bushing (threaded)
- lawnmower muffler



Insert bushing into coupling to create adapter.



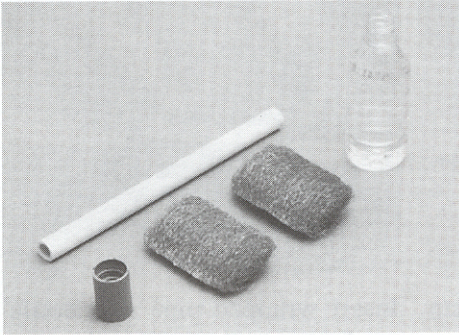
Wrap end of barrel with tape and friction-fit adapter into place.



Screw muffler into adapter.

(Note: There is not an unimpeded passage through the muffler for the bullet; drill or punch through partition in muffler before installing. Criss-cross muffler opening with metal repair tape for smaller exit hole. *Also be advised that some authorities consulted maintain that adapters in and of themselves count as suppressors if they are used to hold improvised silencer components.*)

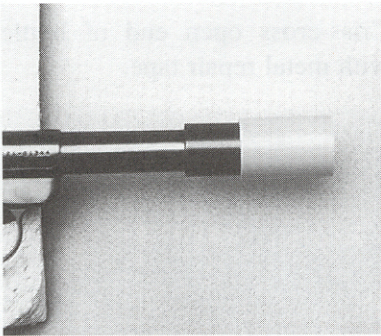
"TORNADO TUBE" BOTTLE SILENCER



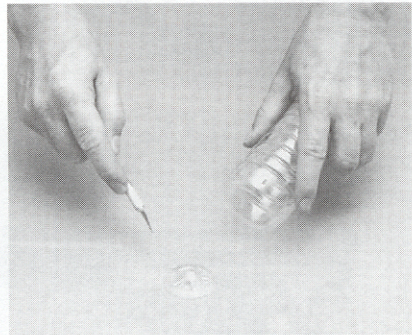
Materials needed:

- "Tornado Tube"
- plastic water bottle (11.2 fl oz/330 ml)
- medium-coarse steel wool pads (2)
- section of 1/2" PVC pipe

This silencer takes its name from the adapter fashioned from an educational toy sold in teacher supply stores. The Tornado Tube is a short plastic cylinder threaded in both ends and used to connect two large plastic soft drink bottles mouth to mouth. By filling one of the bottles with water and inverting it over the other bottle according to instructions, a tornado-like whirlpool vortex can be created as the water drains from the upper bottle, through the Tornado Tube, and into the lower bottle.

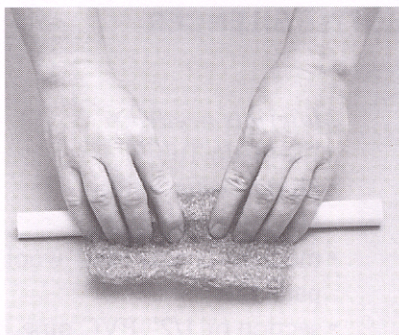


Wrap end of barrel with tape and friction fit Tornado Tube into place.

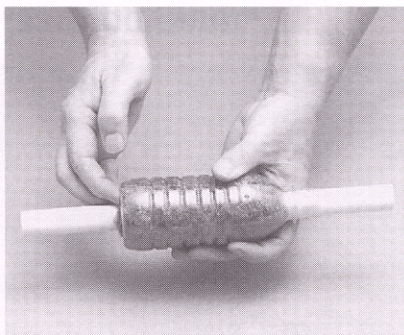


Cut out bottom of bottle.

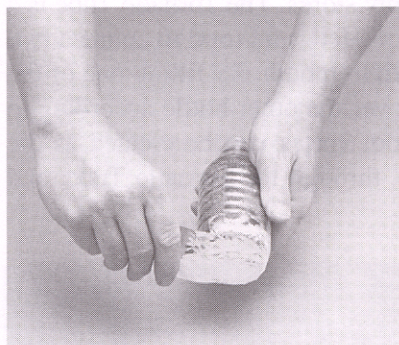
More Workbench Silencers



Unfold steel wool pads and wrap around pipe.



Insert wrapped pipe into bottle as shown; pull pipe out through bottle mouth.



Criss-cross open end of bottle with metal repair tape.



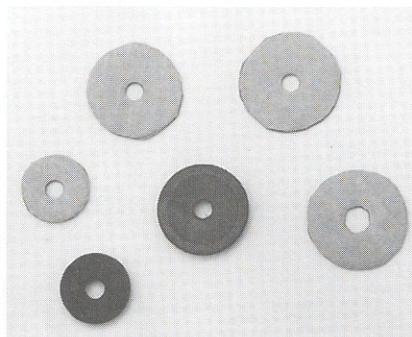
Screw bottle into adapter.

SLIP-ON SILENCERS

The following four designs are for silencers that slip onto the Ruger bull barrel without benefit of adapters or couplings. The only barrel preparation involves making a few tape wraps to insure a snug friction fit into standard 1-inch aluminum tubing.



The tubes can be packed solid with cardboard washers or interspersed with neoprene washers that serve as baffles or wipes. (Masking tape was used in place of black electrician tape for photo contrast.)



Prepare cardboard washers by laying out a grid of squares on cardboard stock, criss-crossing them with diagonals to find their centers, and then drawing in the circles for washer and hole diameters. Cut out separate squares, then cut off corners until washer is roughly circular.

(The remaining small corners on the multisided round polygon make for a more forgiving fit than that of a washer intentionally cut out as a circle; the latter's fit is usually too loose or too tight.)

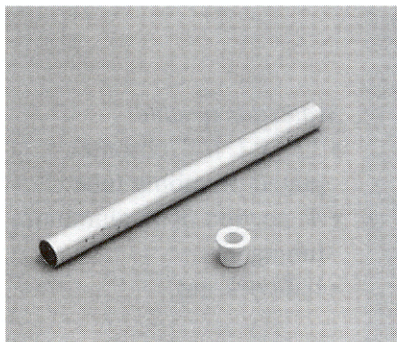
More Workbench Silencers

Punch out center holes with paper punch. Note larger hole in washer for larger caliber firearm; several punches are required.

Some neoprene washers can be made to fit very tightly into certain metal tubes, either by forcing them in or by first filing down their perimeters until they can be forced in. The smaller washer can be filed down to fit inside standard 1" aluminum tubing. The larger washer can be forced into a 1 1/4 " chrome-plated plumbing tube with no filing required. Wrap the top of a large dowel with tape to the same inside diameter as the tube and use it as the piston-like ramrod to force the washers down the tube. Measure the tube and make appropriate marks on the dowel for spacing the washers at given intervals.

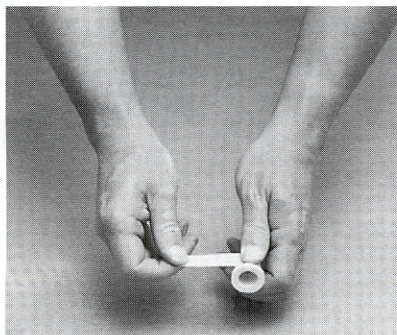
In order to keep washers from being knocked askew by slightly off-center bullets, it might be a good idea to glue two washers together into one thick washer and then countersink the hole on one side to form a larger opening for the bullet to enter.

SLIP-ON SILENCER TUBE #1

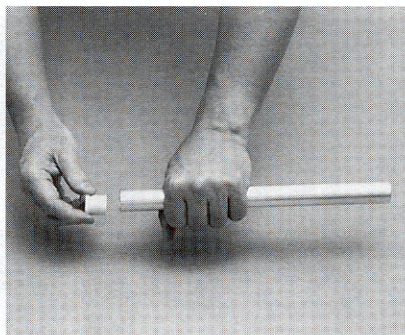


Materials needed:

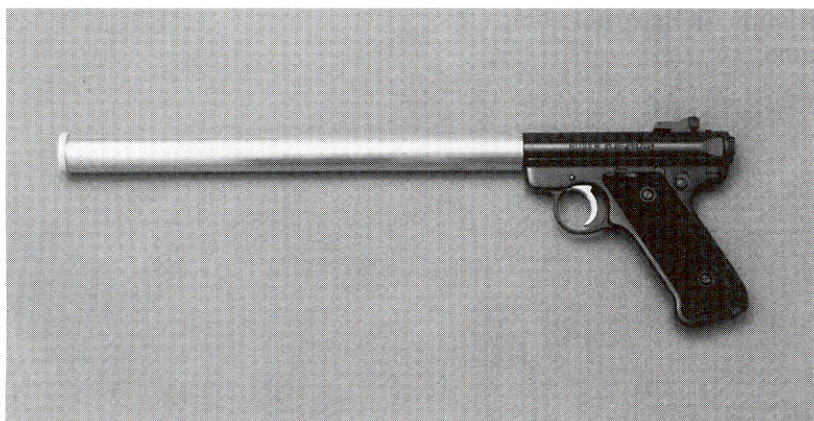
- 12" section of 1" aluminum tubing
- 3/4" x 1/2" CPVC bushing



Wrap bushing with tape for friction fit into tube.

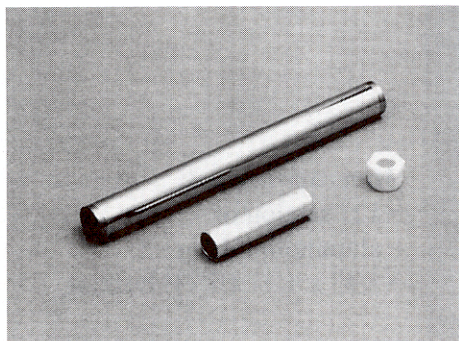


Insert bushing into tube.



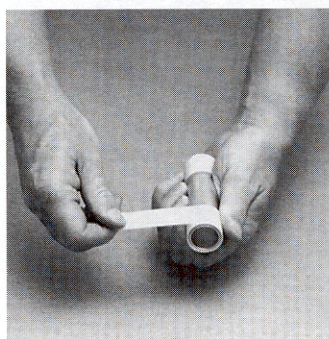
Install on firearm.

SLIP-ON SILENCER TUBE #2

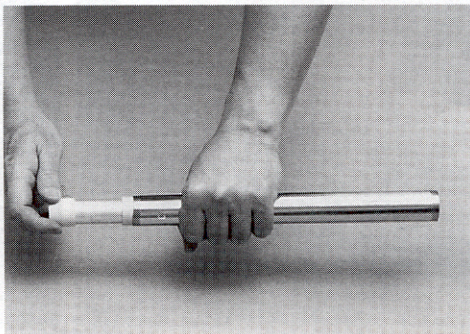


Materials needed:

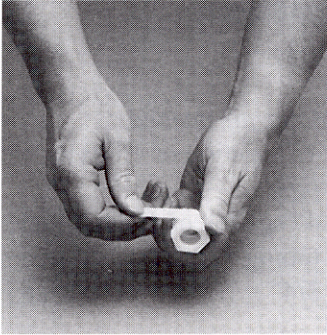
- 12" x 1 1/4" chrome-plated plumbing tube
- 4" section of 1" aluminum tubing
- ballcock nut



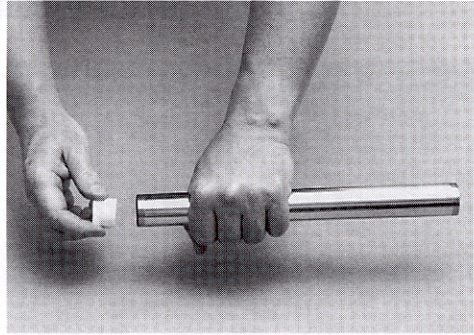
Wrap each end of aluminum tube with tape for friction fit into plumbing tube.



Insert aluminum tube flush into one end of plumbing tube.



Wrap ballcock nut with tape for friction fit into plumbing tube.

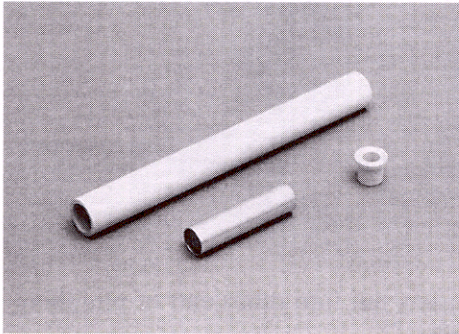


Insert nut into other end of plumbing tube.



Install on firearm.

SLIP-ON SILENCER TUBE #3



Materials needed:

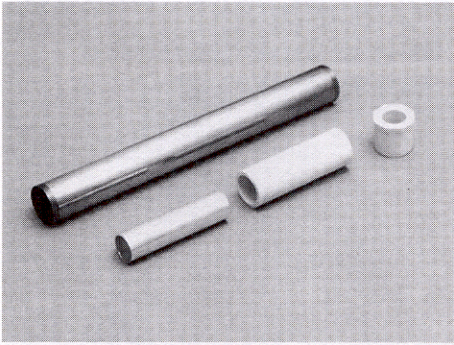
- 12" section of 1" PVC pipe
- 4" section of 1" aluminum tubing
- 3/4" x 1/2" CPVC bushing

Follow same instructions for slip-on silencer tube #2.



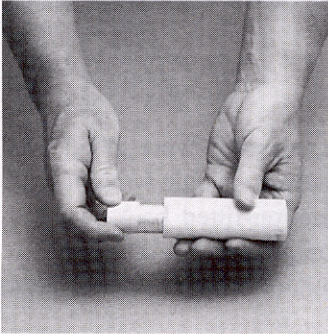
Install on firearm.

SLIP-ON SILENCER TUBE #4

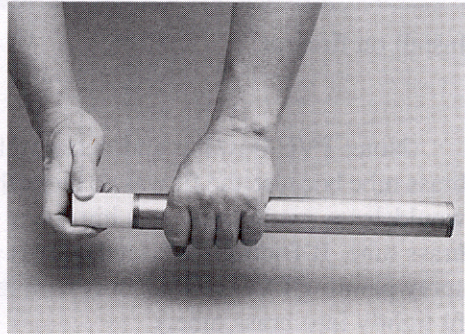


Materials needed:

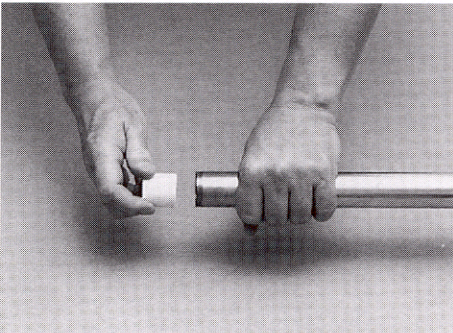
- 12" x 1 3/8" brass plumbing tube
- 4" section of 1" PVC pipe
- 4" section of 1" aluminum tubing
- 1" x 1/2" PVC bushing



Wrap ends of aluminum tubing with tape and friction fit into PVC pipe .



Glue PVC pipe into one end of brass tube.



Glue bushing into other end of brass tube.



Install on firearm.

(Note: PVC bushing and nested tube assembly were glued into brass tube because the fit was so close that even a single wrap of tape would have made them too big to be friction-fitted back into the brass tube. If friction-fitted, take-apart components are desired. Try spray painting PVC components with layers of primer to make them fit tightly into brass tube.)

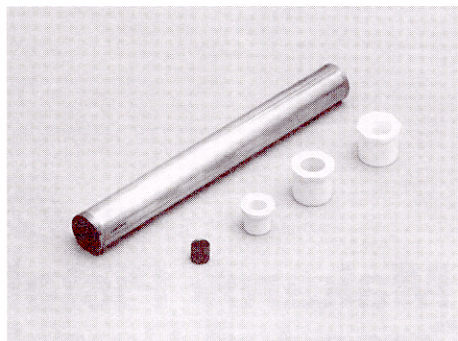
Firearm #2

9x18/.380 Makarov Pistol with Threaded Barrel



The 9x18 Makarov is yet another of those durable, relatively inexpensive Eastern Bloc handguns that became readily available in this country after the dissolution of the Evil Empire. Its fixed barrel can be removed with a pin punch and special barrel press to allow the installation of an extended threaded barrel. The threaded portion of the barrel can be protected from damage by a small screw-on sleeve appropriately called a “thread protector.”

MAKAROV SILENCER

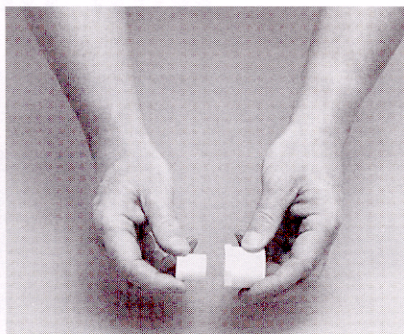


Materials needed:

- 12" x 1 3/8" brass plumbing tube
- thread protector
- 3/4" x 1/2" CPVC bushing
- 1" x 3/4" PVC bushing (threaded)
- 1" x 1/2" PVC bushing

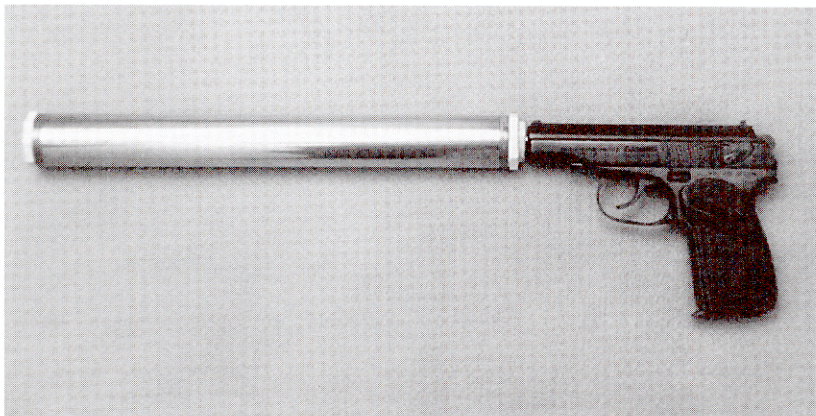


Epoxy thread protector into 3/4" x 1/2" bushing.



Glue 3/4" x 1/2" bushing into 1" x 3/4" bushing.

9x18/.380 Makarov Pistol with Threaded Barrel



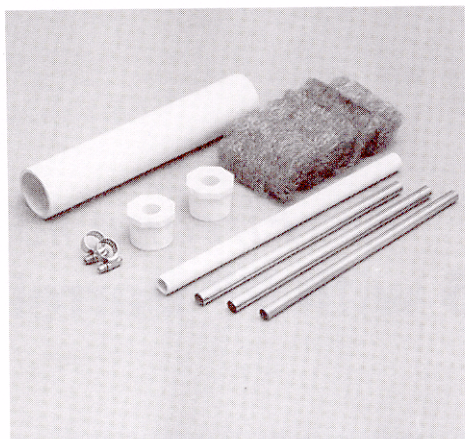
Glue one 1" bushing into tube, pack tube with cardboard washers, glue other 1" bushing into tube, and install on firearm.

Firearm #3
Colt .45 with 7" Barrel



The easily installed 7-inch barrel provides 2 inches of exposed cylindrical stock on which to mount a silencer.

PERFORATED TUBE SILENCER #1

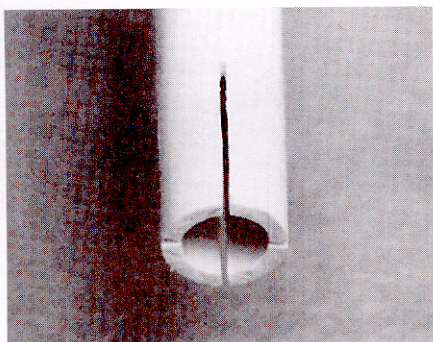


Materials needed:

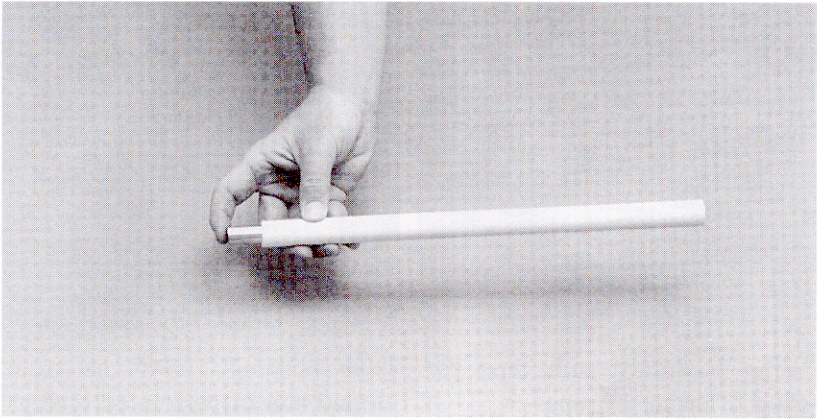
- 12 1/4" section of 2" PVC pipe
- 14" section of 1/2" PVC pipe
- 12" x 19/32" brass tube
- 12" x 9/16" brass tube
- 12" x 17/32" brass tube
- 1 1/2" PVC bushings (2)
- 7/8" band clamps (2)
- medium-coarse steel wool pads (5)



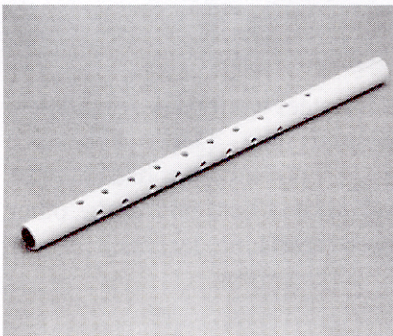
Wrap barrel in 2" metal repair tape for friction fit into 1/2" PVC pipe.



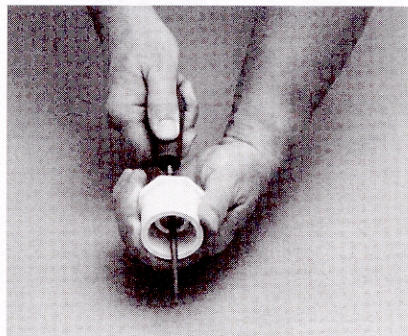
Cut four 1 3/8" slots in end of 1/2 pipe as shown.



Beginning with the smallest brass tube, coat each tube with white shop glue and insert flush into the next larger tube size. Coat nested assembly of brass tubes with glue and insert flush into unslotted end of 1/2" PVC pipe. Allow ample drying time for glue. (An even smaller 1/2" brass tube—having an inside diameter of approximately 15/32" or .47"—could have been nested inside the 17/32" brass tube; the smaller silencer bore, however, would increase the chance of the bullet making contact with the tube.)

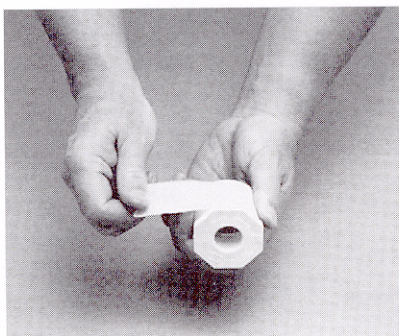


Drill 1/4" holes 1" apart in nested tube assembly as shown.

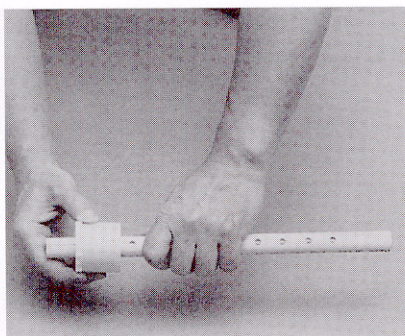


Remove inner "lip" of bushings with round file so that PVC tubing can be inserted clear through each bushing.

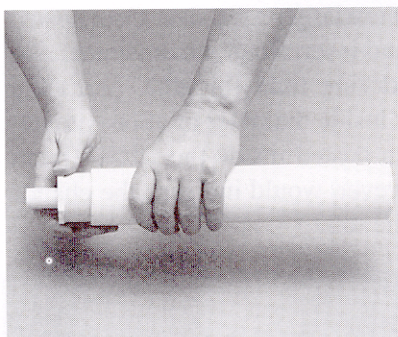
More Workbench Silencers



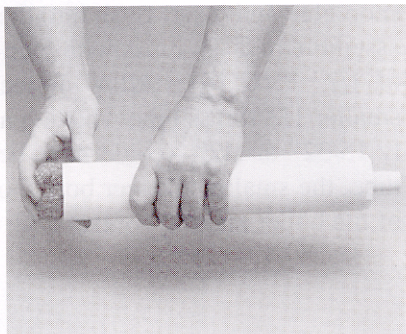
Wrap bushings with tape for snug fit inside 2" pipe.



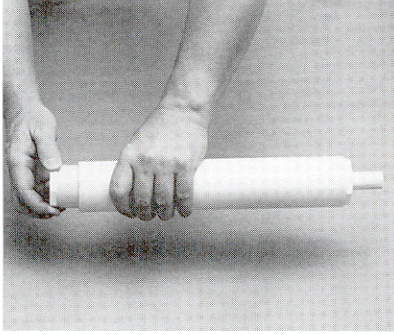
Glue bushing 1 3/8" up from slotted end of perforated tube as shown.



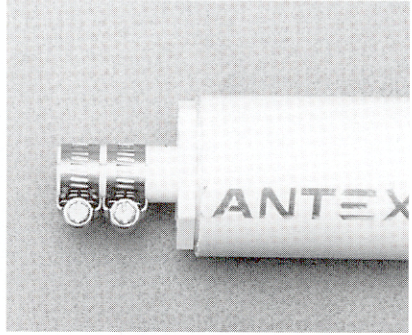
Glue bushing and tube into 2" pipe.



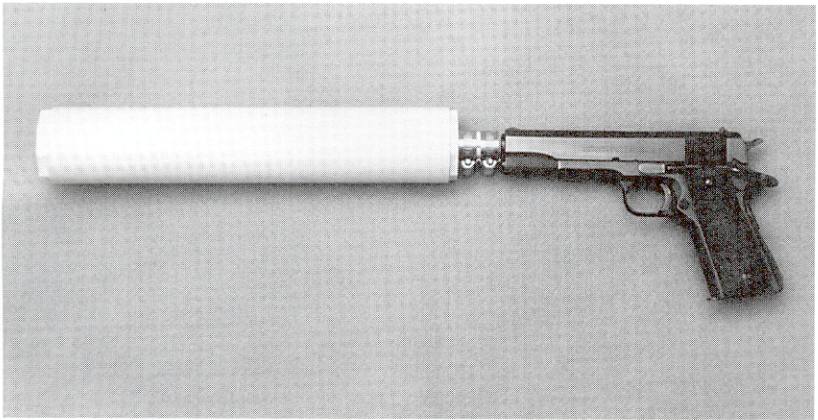
Pack steel wool pads around perforated tube. (More expensive copper pot scrubber pads may be substituted here and in the other perforated tube designs.)



Glue other bushing onto 1/2" pipe and into 2" pipe.



Fit band clamps over slots in 1/2" pipe.



Install on firearm; tighten band clamps. (To give the clamps more "grab" here and in the other perforated tube designs, try dabbing something sticky on the taped portion of the barrel before installing the silencer.)

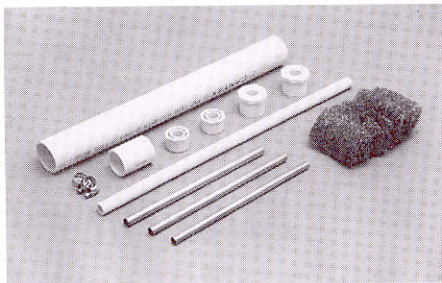
Firearm #4

Colt .45 with 16" Barrel



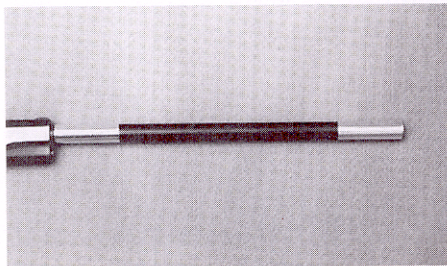
This longer barrel provides a full 11 inches of exposed cylindrical stock on which to mount a silencer. In addition to providing greater accuracy for longer shots, the longer barrel gives the gases traveling behind the bullet time to burn more completely. Theoretically, this should give the bullet a little more zip while at the same time decreasing the amount of still-burning gases escaping from the muzzle. In other words, the bullet should be both faster and quieter.

PERFORATED TUBE SILENCER #2

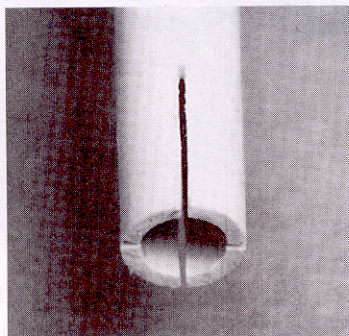


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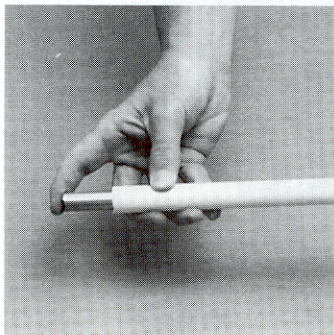
- 21 1/4" section of 2" PVC pipe
- 23" section of 1/2" PVC pipe
- 12" x 19/32" brass tube
- 12" x 9/16" brass tube
- 12" x 17/32" brass tube
- 1 1/2" x 1/2" PVC bushings (2)
- 1 1/4" x 1/2" PVC bushings (2)
- 1 1/4" coupling
- 7/8" band clamps (2)
- medium-coarse steel wool pads (5)



Wrap barrel with 2" metal repair tape as shown for friction fit into 1/2" PVC pipe.

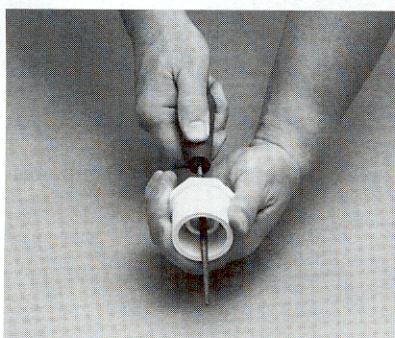


Cut four 1 3/8" slots in end of 1/2" PVC pipe as shown.

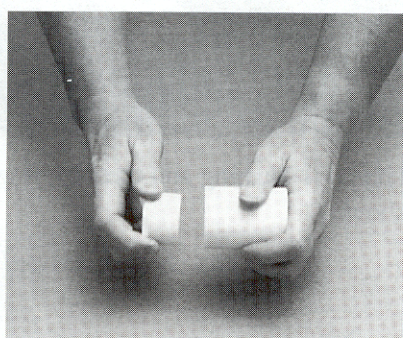


Beginning with the smallest brass tube, coat each tube with white shop glue and insert flush into the next larger tube size. Coat nested assembly of brass tubes with glue and insert flush into unslotted end of 1/2" PVC pipe. Allow ample drying time for glue.

Drill 1/4" holes 1" apart in nested tube assembly as shown.

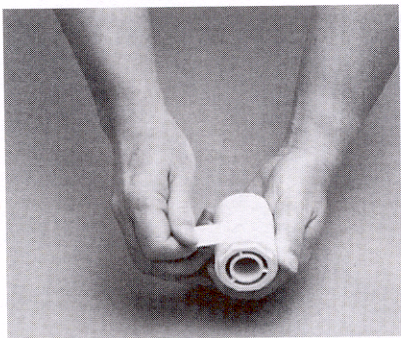


Remove inner lip of bushings with round file so that 1/2" PVC pipe can be inserted clear through each bushing.

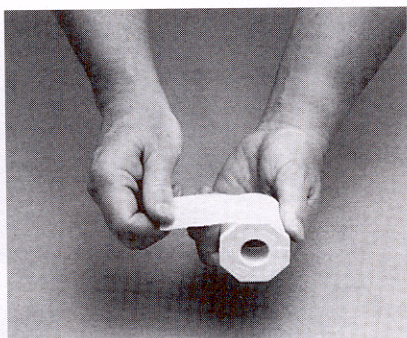


Insert 1 1/4" x 1/2" bushings into each end of coupling. File down any raised bumps or seams on coupling.

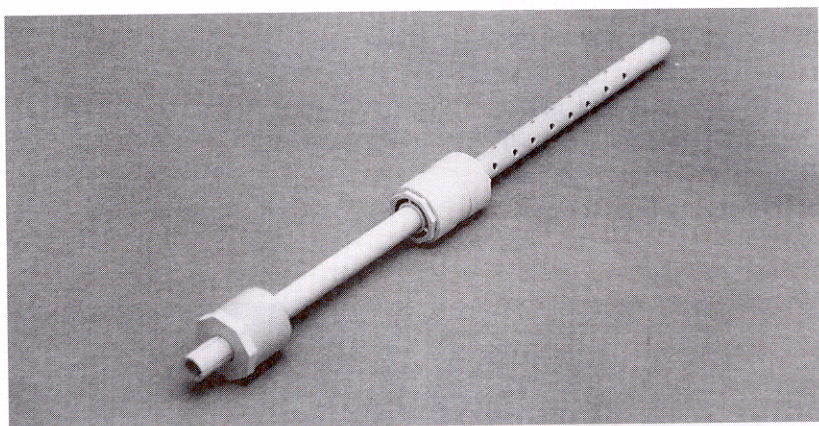
More Workbench Silencers



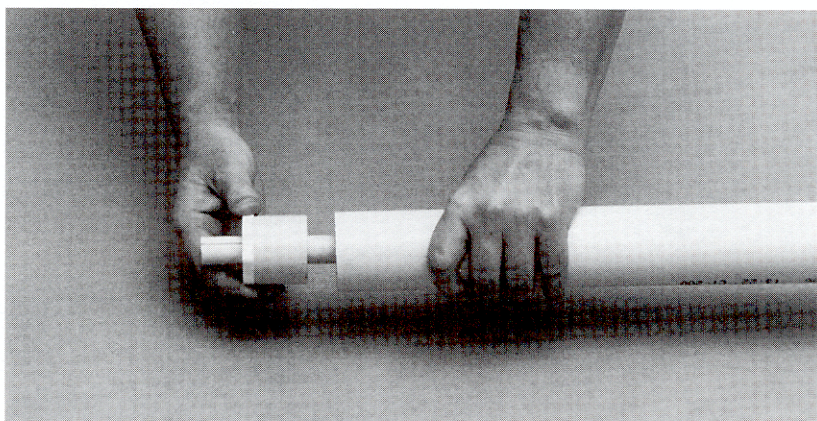
Wrap each end of coupling with tape for friction fit inside 2" PVC pipe.



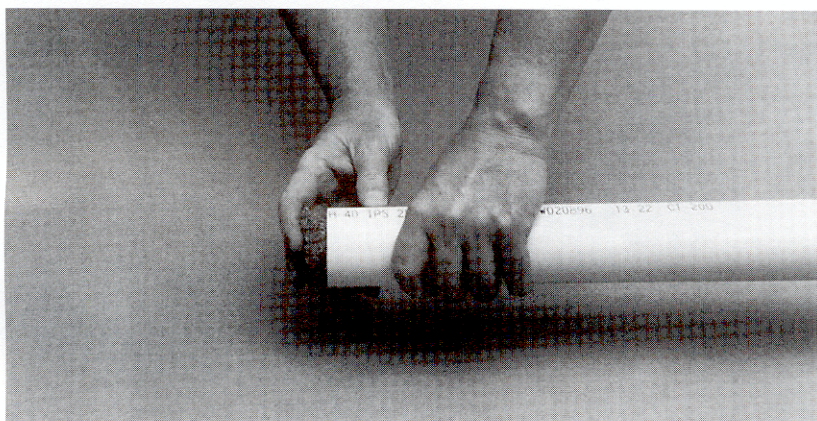
Wrap 1 1/2" x 1/2" PVC bushings with tape for snug fit inside 2" PVC pipe.



Glue one bushing and the coupling assembly onto 1/2" PVC pipe as shown.

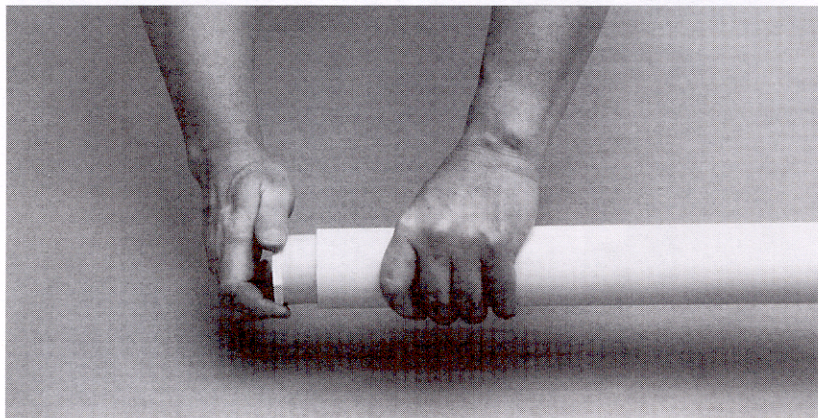


Glue bushing on 1/2" pipe into end of 2" pipe.

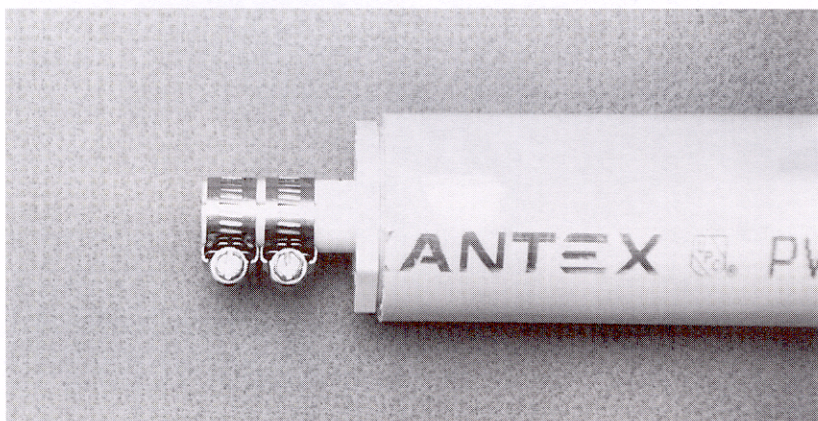


Pack steel wool pads around perforated tube.

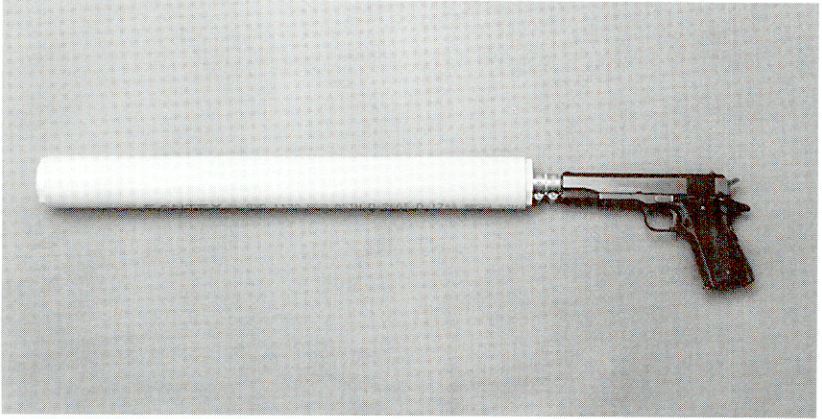
More Workbench Silencers



Glue other bushing onto 1/2" pipe and into 2" pipe.



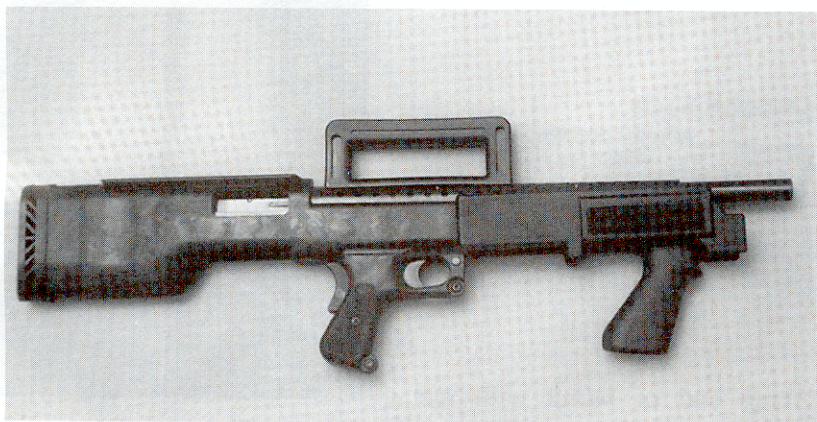
Fit band clamps over slots in 1/2" pipe.



Install on firearm; tighten band clamps.

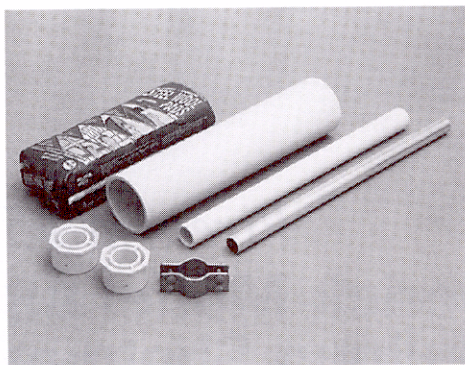
Firearm #5

Maverick Model 88 Bullpup Shotgun

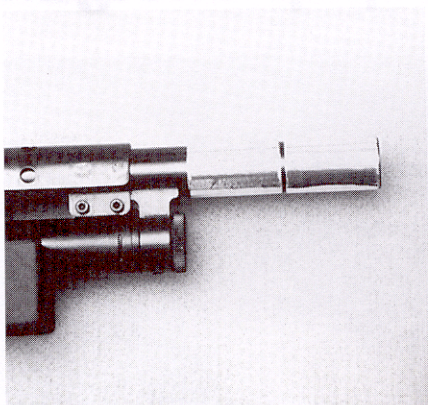


Loaded with 575 grain subsonic Blockbuster slugs, this 12 gauge shotgun is perfect for silencing. Its short bullpup configuration and double pistol grips make handling a snap when there's a long, heavy silencer on the end of the barrel. The 3 inches of exposed cylindrical barrel stock is free of beads or front sights, making it ideal for clamping a silencer onto. The sights atop the carrying handle are high enough that a big, fat silencer won't interfere with the sight picture. A compact, silenced shotgun can also be loaded with frangible slugs for blasting locks and hinges off doors, especially in confined areas.

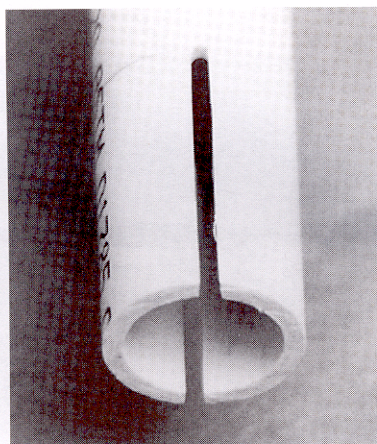
PERFORATED TUBE SILENCER #3



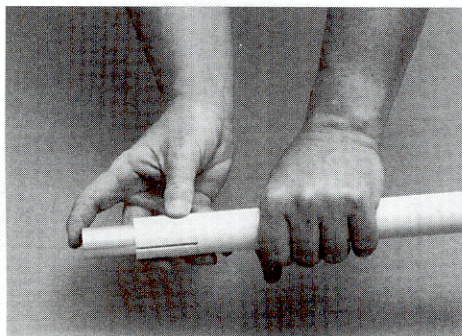
- 15" section of 3" PVC pipe
- 17 3/8" section of 1" PVC pipe
- 17 3/8" section of 1" aluminum tubing
- 2" x 1" PVC bushings (2)
- fork latch clamp
- bag of coarse steel wool pads



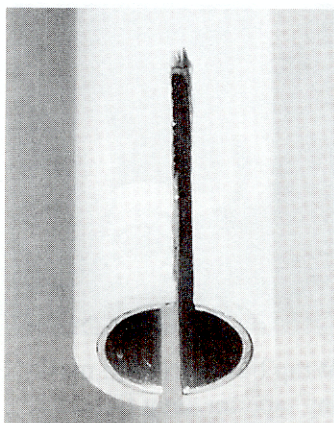
Wrap end of barrel with metal repair tape for friction fit into aluminum tubing.



Cut two 2" x 1/8" slots in end of 1" PVC pipe.



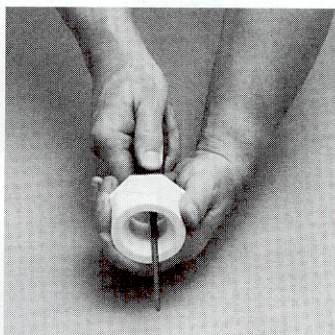
Glue aluminum tubing into 1" PVC pipe. (Shim aluminum tubing with a few wraps of tape in a couple of spots to insure snug fit and good alignment.)



Cut slot in aluminum tubing.

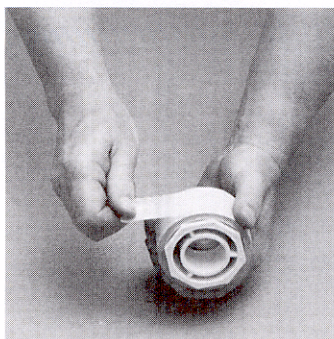


Drill 3/8." holes 1" apart as shown.

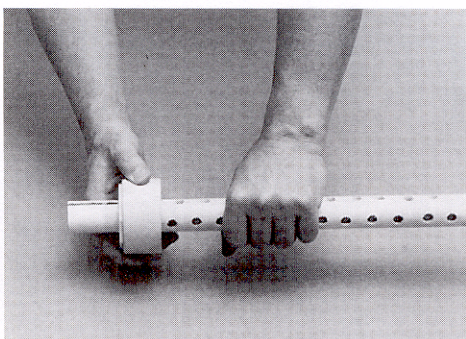


File down lip in bushings so 1" PVC pipe can be inserted clear through each bushing.

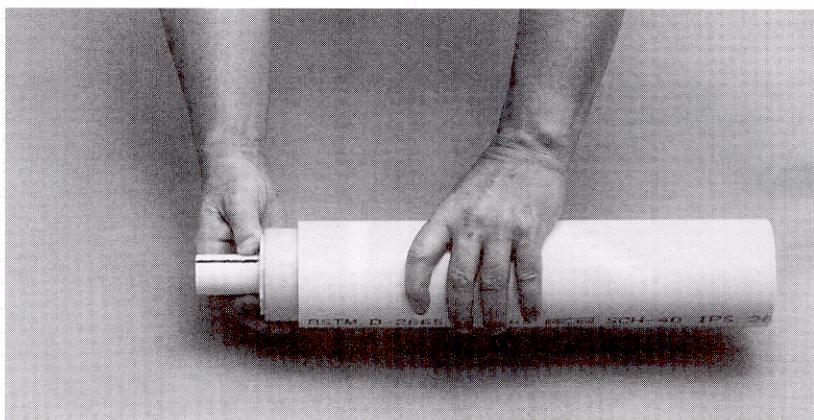
More Workbench Silencers



Wrap bushings with masking tape for snug fit into 3" PVC pipe.

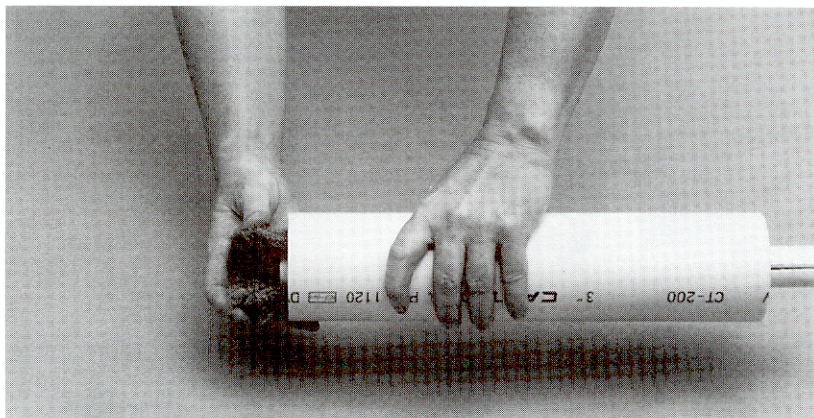


Glue bushing onto perforated tube as shown.

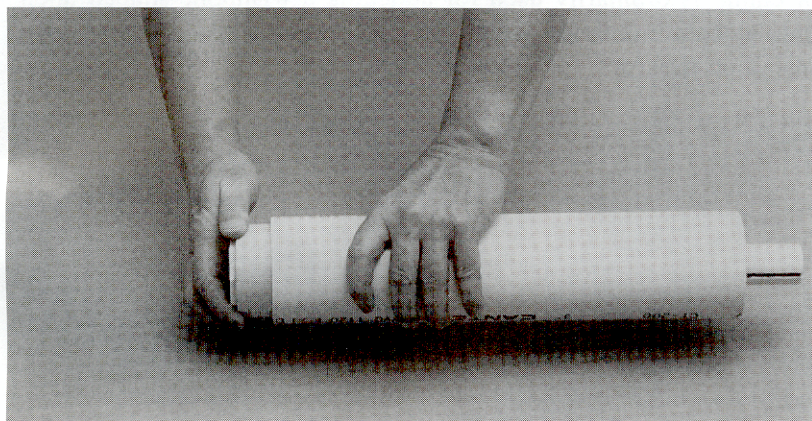


Glue bushing on perforated tube into 3" pipe.

Maverick Model 88 Bullpup Shotgun

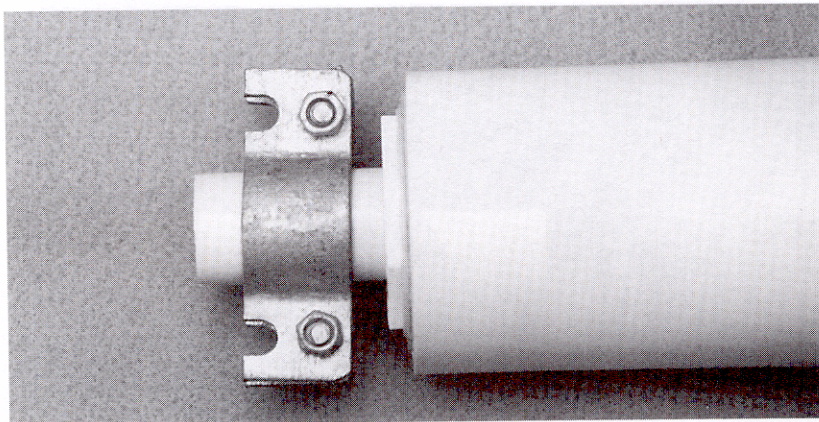


Pack space around perforated tube with steel wool pads.



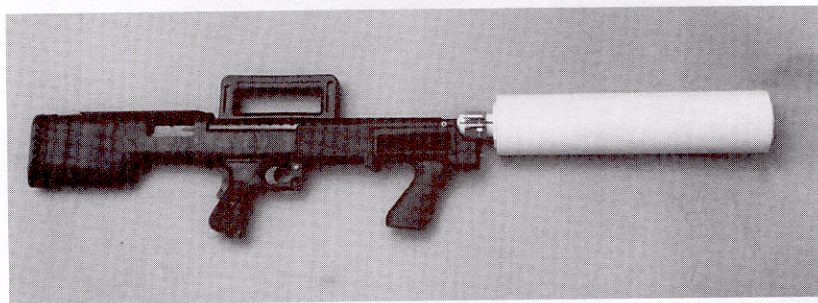
Glue other bushing into end of 3" pipe and onto perforated tube.

More Workbench Silencers



Fit fork latch clamp onto slotted end of perforated tube. (This kind of clamp is ordinarily used for attaching a wishbone-shaped latch onto a chain link fence gate.)

Install on firearm.



(Note: I originally nested a section of 3/4" copper tubing inside the aluminum tubing. Unfortunately, my drill would bind every time it made contact with the copper. Maybe you can solve this little problem. You might also be able to find other tubing to nest inside the copper tubing, thereby reducing the inside diameter of the perforated tube even more.)

Firearm #6

SKS - AK-47 - MAK-90

SILENCER OPERATIONAL ANALYSIS

It's important for you to understand that the effectiveness of any silencer will depend entirely on the firearm to which it is used. The SKS & AK-47 were never intended to be used with a silencer. In explanation, they use super sonic ammunition, they have an extremely noisy action, (they have an action that requires a great deal of energy to operate), they are semi-automatic and there are a few more less than favorable design points. Don't think for a moment that this is a bad firearm, IT'S NOT. It's world famous! It was designed to fill a need and it has done so admirably for 50 years, but as a silenced rifle it has never been widely used. With the standard issue cartridge (7.62 X 39) the bullet will reach super sonic speeds in the first few inches of travel down the barrel. Supersonic bullets produce a pressure wave special to themselves, a very loud super sonic pressure wave, very different from a subsonic bullets signature. Only by using a ported barrel, a 220 grain bullet, using reduced propellant charge and a gas port cut out, will you be able to truly "SILENCE" your SKS, AK-47, MAK-90.

A HIGH TECH LOOK AT SILENCER FUNCTION

1. PRECURSOR The noise related to that air, forward of the bullet being forced out of the firearms barrel. In small caliber, low velocity firearms the small signal isn't audible but in large bore supersonic firearms, it is easily recorded.

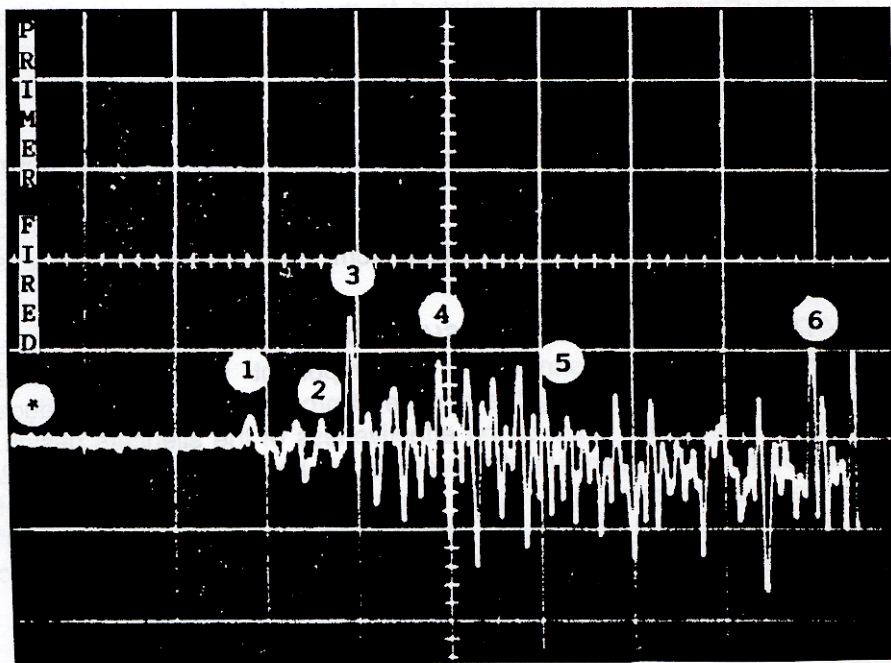
2. BLOW - BY The gas that escapes by the bullet as it passes down through the silencer's chamber. This is similar to the precursors effect but deals specifically with silencer precursor or blow by. Also included will be case chamber blow by exiting from the bolt face, and the gas tube vent holes.

3. ATMOSPHERIC OVERPRESSURE OR MUZZLE BLAST The ADIABATIC (HEAT) expansion is an important factor in firearms silencers. Cooling & slowing the release of propellant gases will reduce the noise level to the point of the effectiveness of the silencers design. Eighty percent of a silencers effectiveness will be seen if muzzle blast & heat can be effectively controlled. The muzzle emissions, frequency of resonance in cycle's per second computed for the 7.62 X 39 with a 20" barrel are roughly 10,550 cycle per second, this is well within the sonic range.

4. SONIC TURBULENCE Only occurring in silenced weapons. Caused by the super sonic gases deflecting and swirling inside the suppressor chambers. This can be so violent that it can actually be heard outside the silencer tube. This effect is more pronounced in silencers using a thin wall tubing, and can be eliminated by tightly wrapping the silencer tube with a dense cloth or rubber.

5. MECHANICAL NOISE In a semi-automatic it is the most pronounced noise. To prove this to yourself, manually cycle your empty, (no bullets) firearm through its function, allowing the bolt to slam closed. Weapons today with integral silencers are designed with the elimination of mechanical noise as a primary concern, and these futuristic firearms function nothing like the firearms designed just 20 years ago. There is very little you can do to eliminate mechanical noise except to lock the bolt closed by installing a gas port valve, page 31.

6. SONIC CRACK Very simply, if your bullet leaves the muzzle above the speed of sound you will hear a miniature sonic crack. This noise can be eliminated by reloading. It is very common for reloaders to under load or down load to save money and to extend case and firearm life.



SUB-SONIC AMMUNITION PROFILE

① **BULLET WEIGHT** - Bullet weight is important to the target shooter for its effects on sectional density; hunters are concerned with bullet weight for its implication to penetration of potential game; silencer shooters need extra weight to reduce bullet speed to below sub-sonic speeds and still provide sufficient forces to operate the bolt on semi or fully automatic firearms.

② **POINT PROFILE** - The most important aspect in specialty sub-sonic reloading will be the bullet's overall length. The long 220 grain spire point & spitzer point bullets will be excessively long for the 7.62 X 39 cartridge. Sub-sonic reloaders are better suited with blunt, round nose, stable bullet designs. Blunt nose designs will eliminate deep seating problems encountered with the long spire designs. Many blow ups have occurred because of insufficient case to bullet grip. The shock of recoil will cause the bullet to drop into the case. Excessive pressure and improper bullet alignment will surely be the result. Your SKS, AK-47 has been tested to accept chamber pressures of over 60,000 c.u.p.s. Bullet dropping will commonly reach pressures in excess of 100,000 c.u.p.s.

③ **BASE DESIGN** - At sub-sonic speed no apparent ballistic improvements will be found between the available styles (boat tail, flat base, hollow base, etc.). One important point is that in casting your own bullets, never use copper gas checks as an improper installation might allow them to come off inside the silencer chambers. If your next round should strike this gas check the results could be disastrous.

④ **BULLET COMPOSITION** - At sub-sonic speeds your foot pound energy will be somewhere near 500 fp. Using that as a final determination of stopping power, it is far better to have a bullet that will retain its shape, giving you greater opportunity to penetrate deeply into your target. Thus, allowing a greater possibility to strike vital organs. Hunters call this a ballistic door, meaning there is an entrance hole as well as an exit hole. Even when loaded to factory specifications this round proves to be somewhat weak in its penetrating qualities.

⑤ **CARTRIDGE CASE** - The primary function of the case is to seal off the breach at the time of firing. A quick explanation is, the instant the cartridge is fired the internal gas pressure will expand the brass or steel case tightly against the chambers wall. It is easy to see the only way out is to push the bullet down the barrel of the rifle. If your case is hard and you have a large chamber it will split open instead of expanding against the chamber walls and spring back slightly. If your case is too soft it will expand tightly sealing off the breach but it will remain expanded against the chamber walls making extraction extremely difficult. There is a fine line between too soft and too hard. The subsonic shooter will need to re-soften the top one half of his subsonic ammo to ensure this critical seal is maintained. Closely inspect the extractor claw and extractor groove around the base of your case for signs of tearing or ripping, this will indicate excessive softness. On the other hand, burned powder stains extending down the side wall of your case or split open cases will indicate excessively hard cases. Remember, this is for the bullet, powder, and primer combinations being used, it is important to think of the case as being a re-usable, flexible container for the primer, the powder, and the bullet.

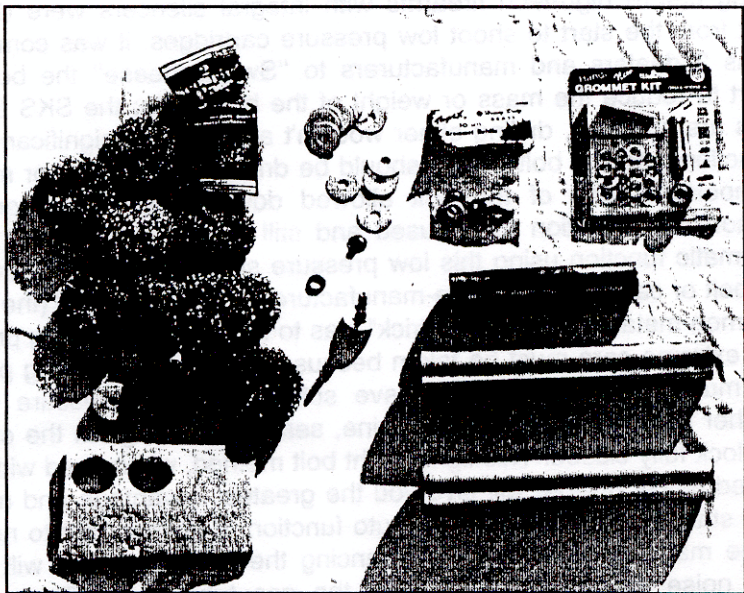
The 7.62 X 39 mm will achieve a peak chamber temperature of 2000° and develop pressures over 3000 pounds per square inch. During the propellant gases expansion into the silencers cavities, the propellant gas mixes with the air contained within the silencer. The air (originally at outside pressure and temperature) is compressed and mixed while the propellant gas, pressure and temperature naturally decreases during this mixing process. In this system, the silencers volume is well over 20 times that of the gun barrel volume. The conditions within the silencer just prior to the bullets exit are near 300° and 60 pounds per square inch, with a projectile speed of just over 1000 FPS.

Subsonic ammunition is required to achieve this drastic reduction in heat and pressures, and for the resulting low sound signature to be as stated.

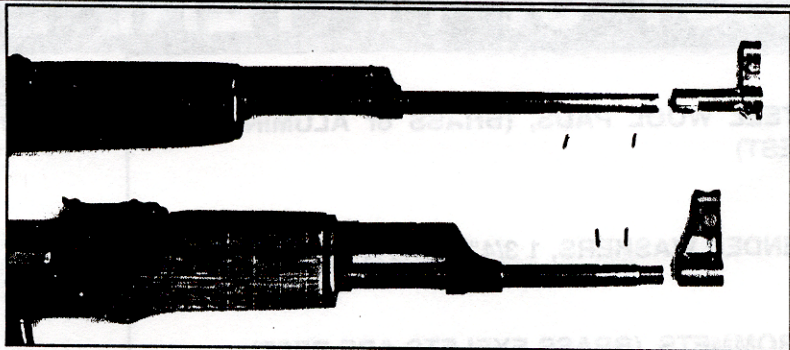
The speed of propellant gases behind the bullet and time elapsed as gas expands into the silencers chambers can be evaluated from the graph on page 7. NOTE: The graph has been obtained through the use of subsonic ammunition at or near muz-vol 1000 FPS. and cannot be interpreted to the use of super sonic ammunition.

CLASS TWO GUNSMITHING SECRETS

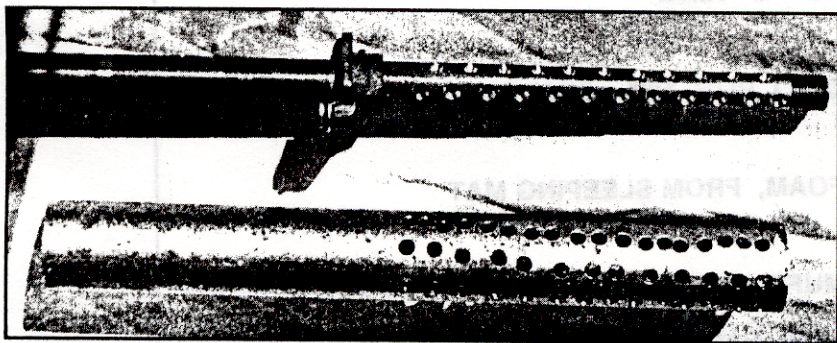
Long before high-tech firearms with integral silencers were designed right from the start to shoot low pressure cartridges, it was common for Class 2 dealers and manufacturers to "Swiss cheese" the bolt in an effort to reduce the mass or weight of the bolt, Note: the SKS & AK-47 bolts are so small, drilling either wouldn't achieve any significant weight reductions, so the bolt carrier should be drilled. This drilling or milling of unimportant parts of the bolt allowed down-loaded or under-loaded subsonic ammunition to be used and still retain reliable semi or fully automatic function using this low pressure subsonic ammo. Many times the bolt or carrier would be re-manufactured using aluminum (the lightest common metal). The easiest "trick" was to reduce recoil spring pressure, but, extreme care must be taken because if you reduce spring pressure too much your bolt will not have sufficient return pressure to strip another cartridge from the magazine, seat the cartridge in the chamber and lock fully closed. This lightweight bolt method, when used with under loaded heavy bullets, will give you the greatest advantage and maintain near standard semi auto or full auto function. It is important to note one of the many disadvantages of silencing the SKS or AK-47 will be the high noise emission coming from the gas tube vents. They can be almost as loud as a .22 sometimes. I began to notice the effect more so when I experimented with slow burning powders and heavy bullet weights. Unfortunately a gas port cut out is the only 100% cure I could find



Starting on the left, steel wool pads, (the coarse wire type), get at least ten of them. The foam sleeping pads used on camping trips are quite adept to the job as a silencer wiper. Using the 1 3/4" muffler pipe as a cookie cutter, cut your circles, then razor cut the center out as shown on page 28. For the baffles you need 16 Fender Washers, 1 3/4" outside diameter by 3/8" inside hole and a 3/8" X 1 1/2" long bolt and nut. Get the 1/2" rubber "O" ring to seal the gas port casting at the silencers end cap. At least 16 GROMMETS are needed and are available at hardware stores, they are made in many styles and metal types, just make sure they have a 3/8" hole in the eyelets. A muffler shop gave me lots of short scrap pieces. I picked them right out of the scrap barrel behind the shop myself, carefully checking for dents, dings and out of roundness, I thanked the workers kindly and drove home ending my shopping spree. I can't imagine living without tools like a simple hand drill, a propane torch and solder and other essential work savers, so I won't include their procurement here.



Begin by removing the sight pins, a gun pin driver set, makes this job a snap! Carefully drive the two sight pins out, hammer the front sight off being careful to protect the sight and the barrel from damage. Pre threaded AK-47's which are to be used for screw on suppressors don't need to remove the sight or drill the barrel.



Thread the barrel (page 21 top) on a lathe or by hand using a common 14 mm X 1 LH die. SKS owners can use a barrel bushing from an AK-47 to protect your new barrel threads, ask GLOBAL SALES for one when ordering threading die. Carefully mark your vent hole locations on your barrel (page 21 bottom). Using a 1/8" drill bit to drill straight through both sides of the barrel, then rotate the barrel 90° and drill the remaining holes. Then use a 3/8" drill to open up the vent holes just a little, **DON'T DRILL THROUGH** with the 3/8" bit!

Use a 3/16" drill bit to make the 1 1/2" muffler pipe spacer ring vent holes, (just eye-balling it) perforate the pipe as many times as you can without reducing strength (page 26 bottom). A mill or drill press would hold the drill bit straight, use a .0625 drill bit for all holes, barrel & spacer rings, smaller holes silence much better.

LIST OF MATERIALS

STEEL WOOL PADS, (BRASS or ALUMINUM ARE BEST)

FENDER WASHERS, 1 3/4" WITH A 3/8" HOLE

GROMMETS, (BRASS EYELETS ARE BEST)

3/8" x 1 1/2" BOLT AND NUT

1/2" 'O' RING

DRILL BITS 1/8" - 3/16" AND 3/8"

FOAM, FROM SLEEPING MAT

MUFFLER PIPE (CUT TO)

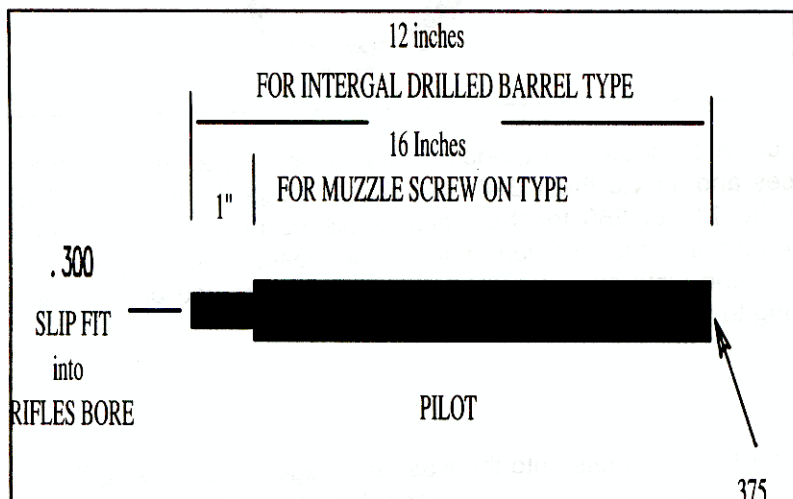
1 1/2" x 12" 14 Pieces Drill for Spacer Rings

1 3/4" x 8 3/8" Front Tube

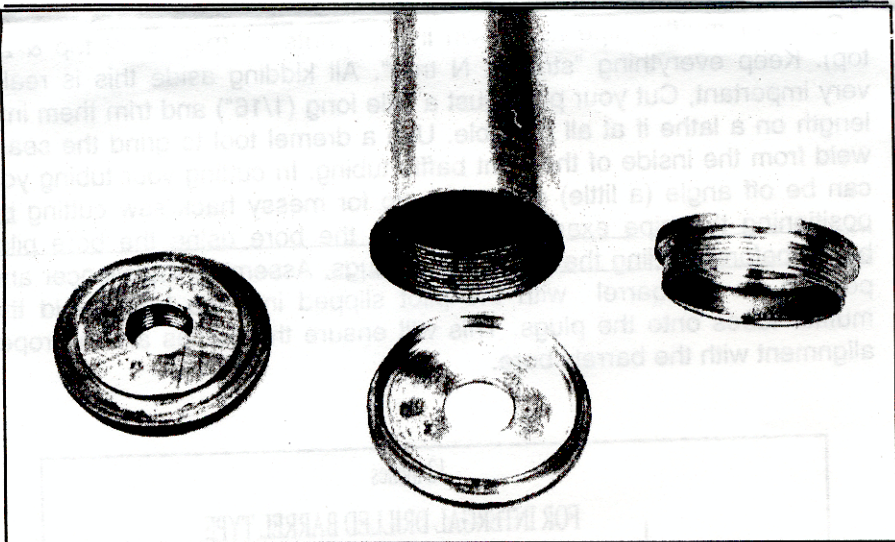
2" x 6 3/8" Rear Tube

STEEL 2" x 2" Round Stock 1018

Cut your muffler pipe as shown in the prints on (pages 22 top & 23 top). Keep everything "straight N true". All kidding aside this is really very important, Cut your pipes just a little long (1/16") and trim them into length on a lathe if at all possible. Use a dremel tool to grind the seam weld from the inside of the front baffle tubing. In cutting your tubing you can be off angle (a little) and make up for messy hack saw cutting by positioning the pipe exactly in line with the bore using the bore pilot below before welding the pipes to the plugs. Assemble the silencer and position on the barrel with the pilot slipped into the bore, weld the muffler tubes onto the plugs. This will ensure the baffles are in proper alignment with the barrels bore.



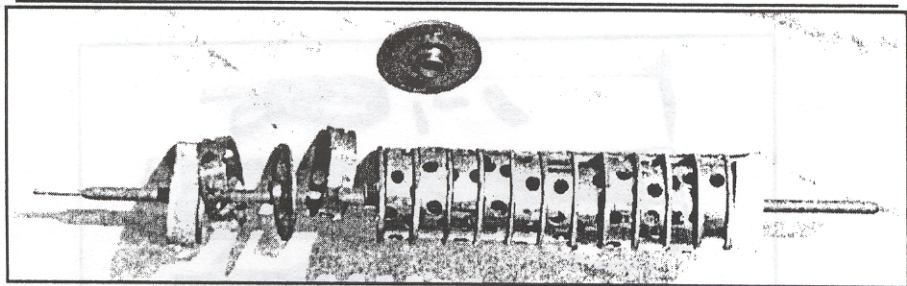
Starting with a 12" or 16" long piece of tool steel (Drill Rod) that is .375 thick. Reduce the .375 to .300 for 1 inch. This is now your Bore Pilot, you are going to insert the .300 end into your rifles bore and stack the baffles and spacers into the muffler pipe using the Bore Pilot as a guide. Screw on the end cap, double check everything for straightness, and position, then weld in place using your rifle barrel as your 'JIG'. It is important to allow the silencer to remain on the rifle so things will not warp during cooling. After cooling you can remove, clean, and reinstall with confidence that you will be "straight N true" with the bore. Whether you are an experienced machinist or kitchen table hobbyist you must keep your silencers baffles in line with the rifles bore. The above pilot will help you do this without expensive equipment.



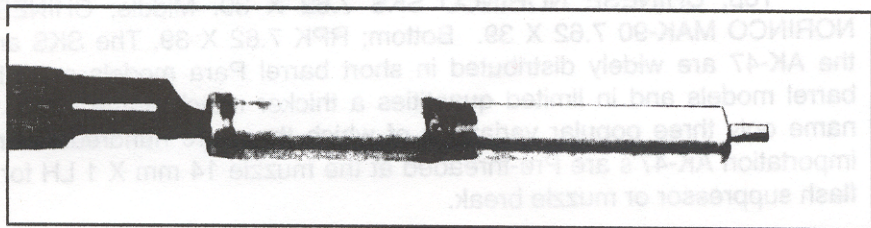
Machine as shown on (pages 24 top & bottom, 25 bottom) the above pieces and thread the 1 3/4" muffler tube page 22. If you don't want to pay the \$40 or \$50 for the machine pieces and you don't care about removing the silencer components for cleaning and replacement, go ahead and weld everything together. It will save you big money by not having to thread the end cap and tubing.

Solder the grommets onto the washers (page 25 top), using the 3/8" nut and bolt to hold everything in place until it cools. It is hard to see in the picture, but I cut a 1/2" long piece out of the center of an old spent 7.62 X 39 shell casing so the 3/8" nut would be touching only the outer grommets face, this prevented the nut from tearing up the grommets. Tighten the nut only enough to hold everything in alignment, not so much as to deform the grommets.

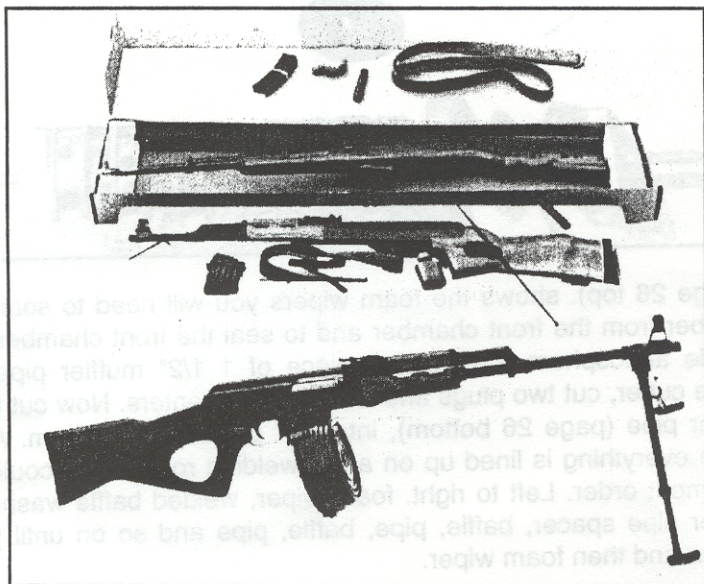




(Page 26 top). shows the foam wipers you will need to seal the back chamber from the front chamber and to seal the front chamber from the outside atmosphere. Using your piece of 1 1/2" muffler pipe as your cookie cutter, cut two plugs and razor slit the centers. Now cut the 1 1/2" muffler pipe (page 26 bottom), into 3/8" pieces, 14 of them. As shown above everything is lined up on a arc welding rod so you could see the placement order. Left to right. foam wiper, welded baffle washer, drilled muffler pipe spacer, baffle, pipe, baffle, pipe and so on until your final washer and then foam wiper.



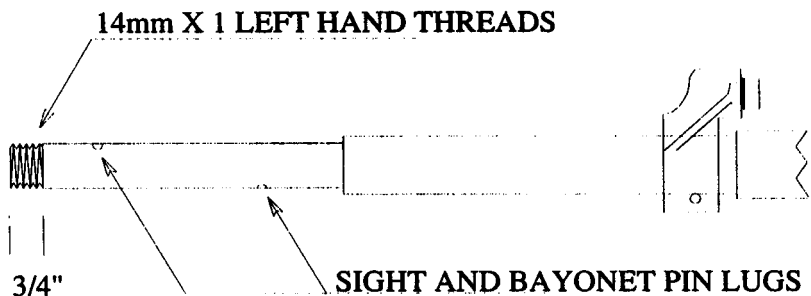
Using your rifle as a "JIG", position the entire silencer assembly onto the rifle barrel using the BORE PILOT page 17, as your guide. Now clamp everything in place so it won't shift position during welding and cooling. Go ahead and weld the rear muffler pipe & the front muffler pipe onto the center plug for drilled barrel integral silencers. Weld the center and the rear plug onto the muffler pipe for screw on muzzle suppressors.



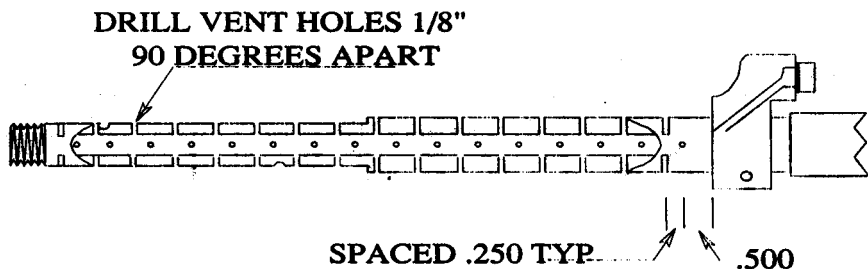
Top; CHINESE NORINCO SKS 7.62 X 39. Middle; CHINESE NORINCO MAK-90 7.62 X 39. Bottom; RPK 7.62 X 39. The SKS and the AK-47 are widely distributed in short barrel Para models and rifle barrel models and in limited quantities a thicker match grade barrel to name only three popular variations of which there are hundreds. Early importation AK-47's are Pre-threaded at the muzzle 14 mm X 1 LH for a flash suppressor or muzzle break.

The need to remove the suppressor for whatever reasons is easy, you can install a screw on front suppressor without drilling your barrel as shown on page 21. Weld the rear plug to a spare barrel bushing, this way you can remove the original barrel bushing and install the silencer. Also drill the center plug out to .625 and finally weld everything together, or thread it as shown in the blueprints and you will have the ability to disassemble and clean.



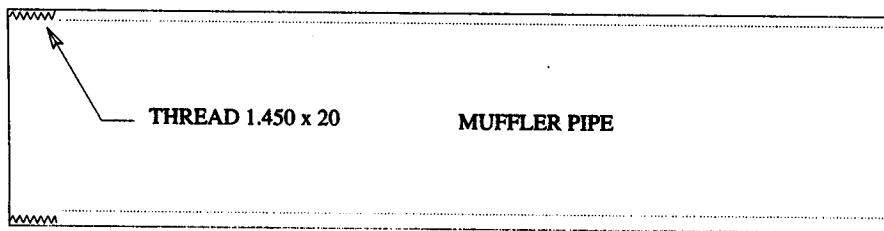


↑ GLOBAL SALES, LTD. P.O. BOX 1000 DELTAS, UT. 84624 Stocks the proper die to thread the front barrel to fit the AK-47 screw on barrel bushing, muzzle break, flash hider, etc. Order Part # 12-11 it should be a 14mm X 1 Left Hand Die.



↑ This drilling is optional, you can have a screw on suppressor (top) or a permanently drilled installation (below). The reduction in noise trade off is quite small between the 2 models. The benefits of the drilled barrel model rests in its ability to operate semi and full-auto with greater reliability by allowing the use of slightly more of a higher burn rate propellant charge.

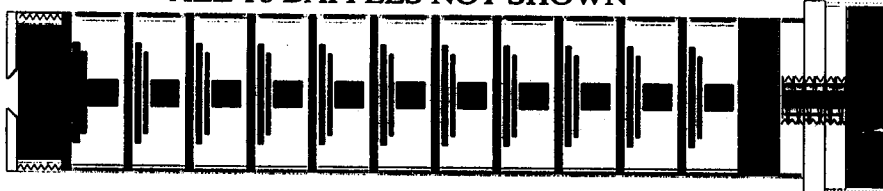
**FRONT
SILENCER TUBE
8.375 LONG x 1.500 INSIDE DIAMETER**



.750

↑ Common Automotive Muffler Tubing. Try to find straight pieces at your local muffler shop. Many auto parts stores have tubing that has it's end expanded so a center plug would not be necessary.

**FRONT BAFFEL CHAMBER
DRAWN FOR PERSPECTIVE
ALL 16 BAFFELS NOT SHOWN**

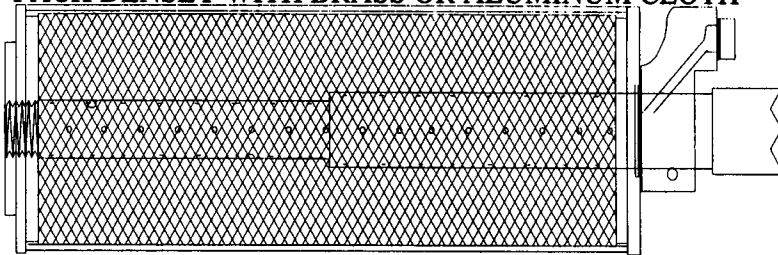


↑ Front Assembly showing the relationship of parts. If a screw on front suppressor is your choice you should drill the center plug out to 5/8 instead of threading it to 14mm X 1 Left Hand (to clearance the bullet).

COMMON 2" MUFFLER PIPE 6 3/8" LONG

↑ If a front screw on suppressor is used, a screen rolled into a 5/8" diameter tube which can then be centered inside the rear expansion tube. This screen will keep the steel wool pads or wire cloth from falling into the bullets path. A little oil on the steel wool will help reduce noise and increase usable life.

PACK DENSELY WITH BRASS OR ALUMINUM CLOTH



↑ **Rear Expansion Chamber.** The steel wool should be packed into the tube and around the barrel evenly, until you can't get any more in, then screw on the center plug to seal off the expansion chamber.

CENTER PLUG
THREAD 14 MM X 1 LH FOR INTERGAL SUPPRESSOR
CLEARANCE .625 FOR MUZZLE SCREW ON TYPE



→ A hand held propane torch will solder the fender washer and the brass grommet nicely. You should sand the surfaces with a 180 grit paper emery cloth to remove surface dirt and expose fresh surface metal.

FENDER WASHER
.062 THICK

SOLDER OR BRAZE
WASHER TO GROMMET



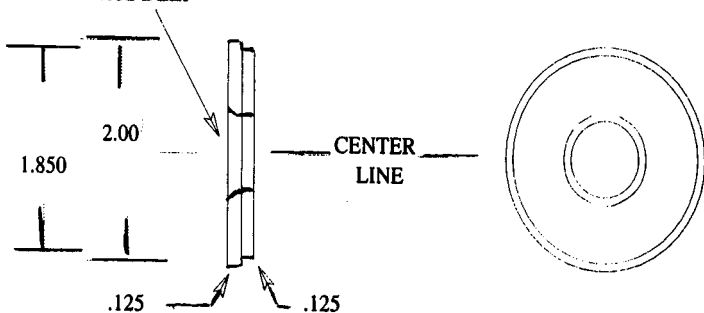
INTERGAL SUPPRESSOR TYPE

DRILL .630

CAMFER AT 45 DEG

.032 DEEP

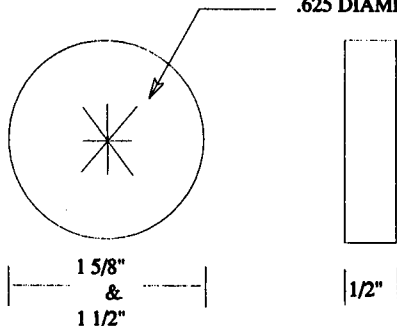
MANUFACTURE FROM
STEEL



INCREASE TO .25 FOR MUZZLE SCREW ON
THREAD 14MM X 1 LH

FOAM WIPER

RAZOR 4 CUTS
.625 DIAMETER

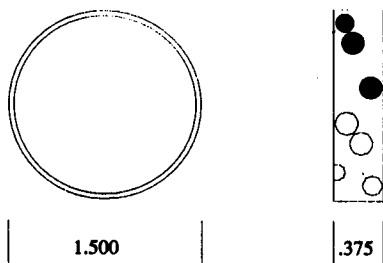


←Dense open cell foam is best. A cheap alternative would be to use a foam camping matt used to sleep on.

COMMON FOAM SLEEPING MATTRESS
USED FOR CAMPING

→ The smaller the vent holes in the barrel the better. The draw back being that a 1/16" drill bit will break easily when drilling thin metal like the spacers in the right print and even more so when drilling the high grade steel barrel with it's chrome lined bore. Smaller drills can be used safely with a mill or drill press. Hand drill users should stick with the larger more forgiving 1/8" and 3/16" bits.

1 1/2" MUFFLER PIPE
DRILL 3/16" HOLES IN RANDOM



GAS PORT CUTOUT

On page 10 we learned that Mechanical Noise is one of the problems associated with Semi & Full Auto firearm silencing. The elimination of mechanical noise on AK-47 & SKS rifles is not possible without locking the bolt closed is some way. Rotary (AK-47) or tilt bolt (SKS) systems of size used for the 7.62 X 39 mm cartridge, rely on a gas port to release the bolt lock at a predetermined time in the firing sequence. If propellant gas is refused entry into the gas port, it will not release the cam or rotary lock, the bolt will remain "LOCKED UP", sealing the chamber.

By installing the threaded 8 X 32 X 1/4" SET SCREW into the port casting as shown in the blueprints below, you can improve the versatility and usefulness of your SKS, AK-47. An example could be when sighting in, the gas port "LOCK UP" feature will allow the bolt recoil factor to be eliminated, or if you need to reduce noise of the firearm to it's lowest possible level the "LOCK UP" feature will allow under loaded ammunition to be used. Far more precise & reliable subsonic reloading is possible if the operation of the gas system is not a factor.

8 X 32 X 1/4"
SET SCREW

